Regarding "Reduction in aortic aneurysm size: early results after endovascular graft replacement"

To the Editors:

In the recently published article by Jon S. Matsumura and collegues (J Vasc Surg 1997;25:113-23), the authors correlated perigraft leaking diagnosed with contrast computer tomographic (CT) scans to long-term changes in the size of the aorta and aneurysmal segments. Contrast-enhanced CT scans were performed at 6 months and 1 year after implantation. The CT scans were examined for evidence of perigraft leak outside the lumen of the graft but within the aneurysm sac as determined by contrast enhancement. The 34 patients who were enrolled were divided into the following three groups: group I, no perigraft leak (20 patients, 58%); group II, early perigraft leak that sealed during the first year (7 patients, 21%); and group III, persistent perigraft leak (7 patients, 21%). Aneurysm sac diameter decreased by 0.63 ± 0.58 cm in group I and by 0.34 ± 0.24 cm in group II. In group III, the aneurysm sac diameter increased by 0.19 ± 0.21 cm.

Aneurysmal sac diameter reduction is related strictly to complete exclusion of the sac from the luminal and collateral flow. In the study from Matsumura, the narrow range between mean diameter reduction and standard deviation within each group showed no statistically significant differences among the baseline and follow-up data of groups I and II. We hypothesize that CT scan is not sensitive enough to detect low flow in the aneurysmal sac and to discriminate patients with complete exclusion of the aneurysmatic sac.

We studied 17 patients after endovascular graft placement (mean follow-up time, 12 months; range, 6 to 24 months). Residual flow in the aneurysmatic sac was studied with conventional Doppler ultrasound scans (color Doppler and power Doppler), contrast-enhanced Doppler ultrasound scans (color Doppler and power Doppler), and contrast CT scanning. Preoperative and follow-up aneurysmal diameter was measured with CT scans. In 8 patients, no residual flow was detected in the aneurysmatic sac, and aneurysmal diameter was significantly reduced (1.1 ± 0.3 cm; $p < 0.05$). In 3 patients, residual flow in the aneurysmatic sac was detected with color or power Doppler and contrast CT scanning. In these patients, an aneurysmal dilatation was found (0.8 ± 0.4 cm; $p < 0.05$). In the remaining 6 patients, no evidence of aneurysmatic flow at contrast CT scans was found, residual flow in the aneurysmatic sac was detected by contrast-enhanced color or power Doppler ultrasound scan, and aneurysmal diameter was reduced but did not change significantly (0.1 ± 0.5 cm; p = NS).

Conventional color and power Doppler evaluation of residual flow in arterial aneurysms treated with endovascular prosthesis has similar reliability to contrast CT scanning. Endoluminally placed prostheses represent a new frontier for contrast-enhanced ultrasound imaging.[1,2] Contrast-enhanced ultrasound scan may be a complementary technique to contrast CT scans in the follow-up monitoring of arterial aneurysm that is endoluminally treated.

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REFERENCES

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Reply

To the Editors:

We appreciate Dr. Giannoni and colleagues bringing this data to our attention. We agree with the hypothesis that the types of computed tomography (CT) scans performed in this initial trial of endovascular grafting are not sensitive enough to detect all endoleaks. This hypothesis is supported by their data that demonstrate the increased sensitivity of color or power Doppler ultrasound scans in the detection of endoleak in comparison with conventional contrast CT. The importance of this increased sensitivity is emphasized by the failure of aneurysms to shrink in patients with ultrasound scan–detected endoleak missed on CT scans. Other investigators have found that ultrasound scans have equal or better sensitivity for size changes and endoleaks, especially retrograde side-branch perfusion.[1-3]

We have noted anecdotal cases that confirm this hypothesis, but a direct comparison of these two methods is possible in subsequent endovascular trials with the Endovascular Technologies and other devices. In these studies, the comparison with newer techniques of helical CT scanning will be important.[4] These techniques include thin-cut images, images that are delayed several minutes after contrast infusion, three-dimensional reconstructions, advanced ultrasound techniques that incorporate measurement of pulsatile wall motion as described by the Malmö group, echocontrast enhancement as suggested by Dr.